UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
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FIELD LETTER NO. 37.

July, 1918.

Logan Waller Page, Director.

P. St. J. Wilson, Chief Engineer; J. E. Pennybacker, Chief of Management; Samuel Fortier, Chief of Irrigation Investigations; S. H. McCrory, Chief of Drainage Investigations; E. B. McCormick, Chief of Rural Engineering; Prevost Hubbard, Chief of Tests.

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MANAGEMENT.

The routine and administrative work connected with the order issued by M. L. Requa, Chief of the Oil Division of the Fuel Administration, requiring that delivery of bituminous road materials be made only om permits based on the recommendations of a committee representing the Fuel Administration and the Department of Agriculture, coordinating with the United States Highways Council, has been carried largely by the Management Division. Practically the entire time of Messrs. Clark, Luedke, Adams, and Eldridge of this division has been devoted to this work.

Due to delays of some State highway departments in getting in their plans and specifications on federal aid projects, a very large amount of work had to be crowded into a few days during the latter part of June, in order to prevent a few States from losing a portion of their 1917 Federal Aid allotment. The effort, however, was successful and sufficient agreements were prepared and fully executed so that no funds reverted to the Federal treasury for reapportionment.

CONSTRUCTION AND MAINTENANCE

National Forest Roads.

In July reports were received on five preliminary investigations covering roads with a mileage of 110.77 and an estimated construction cost of $317,442.10, and two reconnaissance surveys, 21.92 miles long, with an estimated construction cost of $177,176.90. The total number of preliminary investigations made to the close of July number 33, with an estimated construction cost of $3,036,420.05, and the reconnaissance surveys total 45, estimated construction cost $5,091,586.63.

In June no preliminary investigation reports were received. One reconnaissance survey report, mileage 33, estimated construction cost $382,648.12, was made.

No bids were received on the Cooks-Collins Project, Washington, or on the Flora-Enterprise Project, Oregon.

Contract for the Alberton Project was awarded to Rajotte, Fobert and Winters. This is a Section 8 project, approximately 4 1/2 miles in length, extending from Alberton to Cyr, Montana, partly within the Iolo National Forest, and estimated to cost upwards of $60,000.

Plans and estimates were received for Custer Peak Section, Deadwood-Hot Springs Road, South Dakota, and for the Monarch Pass and Sedalia-Decker Springs, Colorado, Project.

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TESTS AND RESEARCH

Administration

During the month of July the following changes in personnel have taken place in this division.

R. W. Koblegard and Thomas W. Lewis, laboratory assistants, have resigned.

H. Hoffman has been appointed assistant in quarry investigations.

Mr. Hubbard continued to be actively engaged in passing on permits for the release of bituminous materials in all parts of the country.

Mr. Goldbeck and Mr. Jackson made an inspection trip through the Middle West for the purpose of studying slag concrete and brick road construction.

Routine Tests and Analyses

During July, 28 samples were examined in the chemical laboratory, 17 of which were bituminous material. One hundred and fifty-four (154) samples of non-bituminous materials were examined in the physical laboratory and 118 samples were examined and classified in the microscopic laboratory.

Research upon the Properties of Dust Preventives and Road Binders.

Volatilization tests on bituminous materials have been made in the New York Testing Laboratory gas oven and in the Freas electric oven for the purpôse of comparing these two ovens. Ultra microscopic investigations of the character of highly dispersed colloidal solutions were conducted during the month. In order to obtain reasonably accurate results in counting the extremely small particles formed in this way, it was necessary to use a high magnification (560 diameters) and a dilutent composed of nine parts of Benzo and one part of alcohol.

Non-Bituminous Road Material Investigations.

Owing to losses in the laboratory force practically no research work was done by the physical testing laboratory during the month.

Mr. C. W. Mitman returned from a trip through Ohio and the Southern States where he had been engaged in collecting data on commercial rock crushing and screening operations. He visited 65 plants.

Dr. Ladd is continuing to collect cost data on quarrying in New England.

Concrete Investigations

The investigation of methods for obtaining the best bond between old and new concrete is being continued. Bond tests to determine the effect upon the bond between steel and concrete by coating the steel with various kinds of paints and metallic coatings are being continued in cooperation with the U. S. Shipping Board.

Pressure tests for ascertaining the pressure exerted against concrete forms under various heads and at various stages of the pouring process by different rates of pouring and different mixtures of concrete are being conducted.

IRRIGATION INVESTIGATIONS

Administration.

Dr. Fortier spent the last two weeks of June in a trip to Arizona and New Mexico, chiefly for the purpose of going over proposed drainage work in the Salt River and Rio Grande valleys. The latter investigations, if undertaken, will constitute a continuation of the cooperative work with the New Mexico Agricultural Experiment Station. Dr. Fortier was met in New Mexico by R. A. Hart, S.D.E., and by Prof. D. W. Bloodgood, of the New Mexico station, who have been working for some time past on the Rio Grande problems. His return to Berkeley was routed to take him through the Colorado and Utah fields.

O. V. Adams, S.D.E., has resigned to take up private work.

R. P. Teele, Ec., took leave without pay during the latter part of July, in order to make a study of the water rights on the South Platte River in Colorado and Nebraska in connection with impending litigation between the States named over the use of the waters of the South Platte.

Utilization of Water in Irrigation.

F. C. Scobey, S. I. E., spent about two weeks in an investigation in San Joaquin valley and other portions of California to determine methods which have been adopted by live stock men during the severe drought of redent months to raise sufficient forage under irrigation to carry their stock along until range conditions improve. The results of his investigation were presented to a convention of delegates from Cattlemen's Associations of California held at the University Farm at Davis, June 27 to 29. The meeting was called at the instance of the United States Food Administration as a part of its campaign to increase meat production.

C. E. Tait, S.I.E., has submitted a lengthy report on the Utilization of Mojave River for Irrigation in Victor Valley, California, which it is expected will be published as a bulletin of the Department of Engineering of California.

Pumping for Irrigation.

C. G. Haskell, I. E., returned to Austin, Texas, early in the month from an extensive field study of wells used for irrigation, and has prepared a brief report of his investigations which details the best known methods of providing an easy entrance for the water to give low draw-down under various conditions, as well as other matters connected with the sinking and development

of wells for irrigation. Mr. Haskell is now in the Great Plains, and will spend a part of the irrigation season in Utah after finishing his work there.

Appliances and Equipment for Irrigation.

A. T. Mitchelson, I. E., is at Fort Collins, Colo., conducting a series of tests at the hydraulic laboratory to determine loss of head in siphon spillways of various shapes, and the relative losses in different parts of each model under different conditions. Several small models were studied in the Berkeley office as a guide to the adoption of larger models with the variations to be tested. Particular information will be sought as to the proper proportion and dimensions of the intake end, draft tube and the shape and necessity of the outlet sealing basin with the relative efficiencies of the structure under different forms of these parts. It is estimated that the tests will be concluded early in August.

Drainage of Irrigated Lands.

J. C. Marr, I. E., has been authorized to do the necessary engineering work for the construction of a waste-water canal to relieve conditions requiring drainage on about 8 sections of land on the south side of Salt River project, Arizona. The work will include the location and staking of a waste-water canal about 8 miles long, design of necessary culverts, siphons and other structures, and general supervision of construction. Besides facilitating the irrigation of about 8 sections, at least 160 acres of land now unproductive will be reclaimed by the construction of the canal.

Irrigation Economics.

In reporting upon the status of work on the reconstruction and revision of canal systems in Utah, L. M. Winsor writes as follows: "To show you the spirit of the people in the present reconstruction period, a mass meeting was called some time ago, and without a dissenting vote the water users of Coalcreek decided to turn the entire stream, primary water and all, into high water canals for a period of five days in order that 2000 acres of grain growing on land with only high water right might be saved. One-fourth of the grain produced on the lands thus irrigated will be sold and the revenue turned into the Red Cross funds. Any one in Cedar who dares raise objection to this proposition is very unpopular. The water diverted will result in maturing crops which would otherwise be a partial or complete failure."

The first of the tracts near Durham, Cal., included in the lands of the settlement enterprise now being tried out by the State of California, was allotted to farmers during June. Nearly 4000 acres of about 6000 acres

in the entire plan was disposed of. Work of subdividing the tract was handled partly by M. B. Williams, I. E., in cooperation with officials of the university. A map of the project was prepared by F. C. Scobey, S.I.E. Sixty-three farms were included in the allotment.

R. P. Teele, Irrigation Economist, made a trip to various points in Oregon to report on an irrigation district for the Capital Issues Committee and to discuss future cooperative work with the Oregon Agricultural Experiment Station. A plan for cooperation was drawn up and has since been approved by Mr. Page. While in Oregon Mr. Teele visited several other districts which are likely to ask permission to issue bonds in the near future.

DRAINAGE INVESTIGATIONS

Administration

F. O. Bartel has entered the Army, and has obtained assignment to the 1st regiment of replacement engineers.

Albert O. Kay of Pennsylvania has been appointed Junior Drainage Engineer, reporting in June.

F. W. Stanley has been appointed a first lieutenant in the Engineer Reserve Corps, and is to report at Camp Lee, Va., within a few days.

Construction, Operation and Maintenance.

The cooperative investigation in Michigan has made good progress during June and July, considering the amount of assistance Messrs. Miller, Shafer and Simons has been able to secure.

Department Bulletin No. 652, The Wet Lands of Southern Louisiana and Their Drainage, by Charles W. Okey, was issued June 6.

Prices have been quoted as follows:

Clay Tile. from Texarkana (May), drain tile and sewer pipe 4" to 15", sewer pipe 18" to 24".

F. O. B.	Clarksville, Ark.	Witherspoon, Ark.	Waldron, Ark.	lbs. per feet dt 6	sp.
4 inch	$42.00	$39.00	$47.40		7½
5 "	52.50	48.75	59.25	7½	10½
6 "	70.00	65.00	79.00	10	14
8 "	112.00	104.00	126.40	16	22
10 "	154.00	143.00	173.80	22	31
12 "	196.00	182.00	221.20	28	36
15 "	350.00	325.00	395.00	50	55½
18 "	646.00	714.00	688.50		75
21 "	874.00	966.00	931.50		101
24 "	1140.00	1260.00	1215.00		133

F. O. B. Clarksville, Ark. (May)

from	Kansas City	St. Louis	Houston, Tex.
4 inch		$36.40	$50.50
5 "	$48.00		
6 "	60.00	64.90	
8 "	120.00		
10 "	156.00		
12 "	198.00		

From Montgomery, Ala. (January)

F.O.B.	4"	5"	6"	7"	8"	10"	12"
Montgomery	$17.50	$22.00	$28.00	$38.00	$48.00	$75.00	$100.00
McFall, Ala.	23.80	30.10	37.80	50.46	62.90	96.75	128.65
Talladega, Ala.	21.70	27.40	34.60	46.40	58.20	90.00	119.80

From West Point, Miss. (January)

F. O. B.	4"	5"	6"	7"	8"	10"
West Point	$17.50	$25.00	$35.00	$45.00	$60.00	$80.00
Meridian	21.00	29.50	40.50	52.00	68.50	92.50
Decatur)	21.70)	30.40	41.60	53.40	70.20	95.00
Neshoba)	)					
Russell	23.10	32.20	43.80	56.20	73.60	100.00
Demopolis, Ala.	25.90	35.80	48.20	61.80	80.40	110.00

From Milledgeville, GA. (June - supply of tile not assured)

Milledgeville	$25.00	-	$40.00	-	$80.00
Savannah	33.00	$43.00	60.00		

Organization and Financing of Drainage Districts

Reports have been made upon three drainage districts that have requested approval from the Capital Issues Committee for proposed bond issues.

Run-off

A report upon Run-off in Western Tennessee has been submitted by C. E. Ramser. Reports upon river stages and upon operation of pumping plants are being received from local observers.

Tillable Lands

S. H. McCrory made an examination for tile drainage proposed for the Aroostook experiment farm at Presque Isle, Maine.

Since the last Field Letter, 28 farm drainage reports have been transmitted.

H. M. Lynde has submitted a detailed report upon the Installation of Tile Drain on the Cotton Valley Farm near Tarboro, N. C.

Overflowed Lands

Reports transmitted:

Burgow Creek district,	Pender Co., N. C. (prel.)	by H. M. Lynde
Ball Ridge Creek "	Forsyth Co., Ga. "	" B. S. Clayton
Buffalo Creek "	Carroll Co., "	" J. V. Phillips
Cedar Creek "	Dallas, Wilcox, & Butler Cos., Ala. prel.	Guy A. Hart
Whippoorwill Ditch	Fulton Co., Ind.	by D. L. Yarnell

Reports received:

Fishing Creek district,	Warren Co., N. C. (prel.)	by H. M. Lynde
Kettle Creek district,	Wilkes Co., Ga. (plans)	by J. V. Phillips
Pigeon Creek district,	Ga. (prel.)	by J. V. Phillips

Swamp Lands

Reports transmitted:

Zekiah Swamp district, Charles Co., Md. (plan) - by D. L. Yarnell
Maintenance for Board Creek Drainage District, Beaufort Co., N. C. (recommendations) - by H. M. Lynde.

Irrigation in Humid Region

F. W. Stanley has returned from his trip of inspection to the Pacific Coast, stopping en route in Minnesota and Indiana. F. E. Staebner, D. E., will have charge of the experimental work at Vineland, N. J., planned by Mr. Stanley.

RURAL ENGINEERING

Administration.

E. B. McCormick was at his home in Illinois for about a week, returning to Washington on July 26.

Elmer Johnson left Washington for Tallulah, La., during the latter part of June to continue his experimental work in connection with the dust spraying machine being developed for the control of the boll weevil.

M. C. Betts has been assigned, for an indefinite period, to take up work in the standardization section of the housing division of the Council of National Defense and will begin to devote full time to his new duties about August 1.

Charles Kruegl, who has been on furlough for a number of months, reported for duty on June 15.

A. M. Daniels has been away for about two weeks on annual leave. He returned from his last trip on July 29.

Farm Domestic Water Supply and Sewage Disposal

A tentative layout and design for a combined sanitary and storm water sewer for a portion of the Arlington Experimental Farm has been completed.

An outline design for a septic tank installation to accommodate 15 persons at Norfolk, Virginia, was prepared.

A survey and design for a septic tank installation to accommodate 4 people at Clarendon, Virginia, was made.

Field examination of a suspected water supply in Alexandria County, was made and samples of the water obtained for examination by the Bureau of Chemistry.

Farm Structures

Drawings have been completed for a small portable granary as well as drawings for the second of a series of farm shop designs.

Working drawings are nearing completion for a one and a two-room rural school house. Sketches of these houses were prepared and submitted to the Bureau of Education, Department of the Interior, and were orally approved.

A bulletin on Farmstead Planning, including four typical layouts, has been tentatively completed and is now awaiting approval.

Sketches are now being made for small houses for married farm laborers.

Individual layouts of farmsteads and correspondence in connection therewith have been handled.

Proposals were received for the Arlington Laboratory Building. All the bids however exceeded the appropriation, so revised bids were requested of those who submitted proposals.

Supervision of construction of the Color Investigations Laboratory for the Bureau of Chemistry was continued.

Sketches have been prepared for a small Bull Barn for the Dairy Division.

The drawings and specifications previously prepared for additions to the Color Investigations Laboratory at Arlington were revised and delivered to the Bureau of Chemistry, which is to ask for proposals.

Drawings for a small Well House were prepared for the Bureau of Plant Industry for use in experimental pecan culture.

A bill of materials for the combined corn crib and granary, previously noted, are now ready for distribution. Also for the first farm shop design.

Mechanical Problems

A bulletin on the Care and Repair of Thrashing Machines has been prepared and is now in the hands of the Government Printer.

The heating layout for the Laboratory Building to be erected on the Arlington Farm for this Office was completed.

Drawings were prepared for use in connection with procuring public patents on certain features of an insecticide dust spraying machine, designed by Elmer Johnson. A patent is being applied for.

Preliminary design for a heating plant was prepared for a cooperative breeding and experimental building to be erected at Arlington Farm.

A rough draft was prepared for a memorandum on The Application of Ventilation and Air Circulation to Cold Storage Construction.

Problems relating to and correspondence in connection with the following subjects were handled:

Hydro-electric installations

Farm house lighting systems

Farm house heating plants

Ice House Design and Construction

Farm Water Supply and Sewage Disposal

Small Grain grinding outfits

Wall Plasters and kalsomines

Cold storage on the farm

Farm structures

Farm implements

Tractors

Paints and Painting

Concrete

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